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## VALUE CHAIN ANALYSIS OF HIDE AND SKIN IN DENDI DISTRICT, WEST SHOA ZONE OF OROMIA, ETHIOPIA

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**Abstract:** *Ethiopia has made the leather and leather products value chain among the top four most promising industries in the country due to its strong backward linkages to the rural economy, and potential for poverty reduction. Despite its importance, this critical strategic sector is facing many difficulties including: low quality and fluctuating output price, high and increasing price of input factors and fewer infrastructures which discourage the producers from improving the quantity and quality of skin production. Both qualitative and quantitative data was collected from randomly selected hide and skin producers' households, input suppliers, traders, consumers and support providers. The data were analyzed using descriptive statistics such as frequency, mean, percentage, t-test and chi-square were used to summarize and compare the key variables between the two groups. Multiple linear regression model was used to analyze factors affecting farm level hide and skin supply to the market in the study area. Moreover, a multinomial logit model was applied to explain inter household variation in the choice of a specific marketing outlet. Result of the study shows that fourteen explanatory variables were hypothesized to determine the household level marketable supply of hide and skin. Among these: flock characteristics of sheep by age category, breed type, access to market information, hide and skin farming experience, sex of the household head, age of the household head affects positively and significantly. Three independent variables namely breed type of hide and skin kept, average lagged price and purpose of hide market coop members and skin keeping has been found to be highly significant in the participation decision. There are also two independent variables namely age and purpose of the hide and skin that head affect the participation decision at 1%, 5%, 10% level of significance. Therefore to address the existing gap, a clear policy and strategy for the development of leather sector should be developed by government, the district needs*



*to organize its production base to take advantage of these opportunities, strong extension service and the trader as well as producer should use technology properly, institutionalizing the management of the leather sector will provide a sustainable approach to growth of the sector.*

**Keywords:** Value chain analysis, Hide and Skin, Actors, Multiple regression model, Multinomial logit model

## **INTRODUCTION**

Though Ethiopia has very good potential to produce substantial quantities of hide and skin, the quality of the hide or skin is to a large extent related to the amount of damage to the grain (or outside) surface (ESGPIP, 2009). Despite the large livestock population in the region, value addition for hides and skins is relatively undeveloped. Most of the producers preserve hides and skins using sun drying, suspension drying etc. which lead to inferior quality products and most processors do partial processing and limited benefit from value addition. It has an abundant and renewable resource base in Ethiopia's large population of cattle, sheep and goats, (USID, 2015). With this immense and potentially productive resource, with such influence on household incomes as well as the national economy, it is imperative for the Ethiopians to maximize the economic value of their animal assets, including use of the animal for value added products. Today the sector consists of over 850 legal hide and skin traders, 6515 workers in tanning, 5400 workers in foot wear and leather goods factories (Sinteyehu, 2003). The objective of this study is to analyze Hide and Skin Value Chain in Dendi district of West Shoa zone, Ethiopia.

## **STUDY AREA AND DATA COLLECTION**

Dendi district of Oromiya Regional State, located at 77 km west of Addis Ababa., the capital city of Ethiopia. The district has two major crops production, these are cereal and vegetable based products. Both primary and secondary data collected from Dendi district were used in the study. Primary data was collected from households of hide and skin producers, input suppliers, consumers and support providers through semi-structured interview schedule, key informants interview and focus group discussions. The primary data covered information on socio-demographic characteristics of hide and skin producers and source and level of income of sample farmers, Animal husbandry production, marketing of hide and skin and roles and linkages of value chain actors. The secondary data collected from Dendi



district Livestock Market Development office, Zonal Livestock Market Development office relevant written document from Dendi administrative office.

A two stage random sampling technique was used to select the sample households in the study area. The first stage was simple random sampling of 6 FAs from the 35 FAs found in the district. Then from these 6 FAs 150 households were randomly selected and interviewed. Equal proportion of female headed and male headed households were included in the sample. Both descriptive and econometric analyses were employed to meet the specific objectives of the study. In this study descriptive statistics such as mean, frequency, percentage, t-test, chi-square were used to analyze the collected data and compare the empowered and non-empowered women.

### ECONOMETRIC MODEL SPECIFICATION

In this study, multiple linear regression model was used to analyze factors affecting farm level hide and skin supply to the market in the study areas because of all hide and skin producers participate in the market. Econometric model specification of supply function in matrix notation is the following

$$Y = X' \beta + U$$

Where,  $Y$  = quantity of vegetables supplied to market

$X'$  = a vector of explanatory variables

$\beta$  = a vector of parameters to be estimated

$U$  = disturbance term

A multinomial logit (MNL) model was applied to explain inter household variation in the choice of a specific marketing outlet. Based on McFadden (1978), a household's utility function from using alternative  $j$  can then be expressed as follows:

$$U(\text{Choice of } j \text{ for household } i) = U_{ij} = V_{ij} + \varepsilon_{ij}$$

where,

$U_{ij}$  is the overall utility,

$V_{ij}$  is an indirect utility function and

$\varepsilon_{ij}$  is a random error term.

The probability that household  $i$  select alternative  $j$  can be specified as

$$P_{ij} = \Pr (V_{ij} + \varepsilon_{ij} > V_{ik} + \varepsilon_{ik} )$$

$$P_{ij} = \Pr (\varepsilon_{ik} < \varepsilon_{ij} + V_{ij} - V_{ik} , )$$



Assuming that the error terms are identically and independently distributed with type i extreme value distribution, the probability that a household chooses alternative j can be multinomial logit model (Greene, 2000) as follow:

$$P(\text{CHOICE}_{ij} = j) = \frac{\text{EXP}(\beta_j X_i)}{\sum_{j=1}^J \text{EXP}(\beta_j X_i)} + \dots$$

Where,

$X_{ij}$  is a vector of household of the  $i$ th respondent facing alternative  $j$

$\beta_j$  is a vector of regression parameter estimates associated with alternative  $j$ .

$i$  represents  $i$ th farm household, and  $i=1,2,3,\dots,162$ .

$j$  represents different marketing outlets,  $j=0$  for sale to wholesalers,  $j=1$  for sale to collectors and  $j=2$  for sale to retailers.  $P$  represents the probability of hide and skin marketing outlet  $j$  to be chosen by farm household  $i$ ;  $\text{CHOICE}_{ij} = j$  means that Hide and Skin marketing outlet  $j$  is chosen by farm household  $i$ ;  $X_i$  is independent variable.

Moreover, multicollinearity, endogeneity and heteroscedasticity detection test were performed using appropriate test statistics.

## RESULTS AND DISCUSSION

### Hide and Skin Value Chain Analysis

#### Chain actors, functions and relationships

The major actors in Hide and Skin value chain analysis are producers, farmer traders/village collectors, urban assemblers, wholesalers, retailers, hotels and restaurants, processors, and consumers. Based on the functions potential value chain actors were identified, their roles, function, value adding process, marketing and relationships were sorted out.

**Input Suppliers:** value chain function starts from input use to produce hide and skin with value added products. The only actor that support through supplying exotic improved hybrid in the study area was the office of agriculture and rural development. However, due to lack of supply by the government the office was almost stopped providing the service. The average flock size per family in Dendi district is about 12 and that of dendi district flocks are from both local and exotic breeds.

**Producers:** the total hide and skin in the study area was produced by smallholder hide and skin producers. Producers are also buyers and sellers of hide and skin. The supply and price of hide and skin depend highly on the availability of holydays.



**Urban assemblers:** Urban assemblers: these traders are also important actors in the market chain and they all are male in the study area. They serve the chain by transacting the product from farmers and village collectors to whole sellers and consumers in the district and regional markets.

**Wholesalers:** are those traders who sell large quantities of hide and skin to other traders via brokers or direct communication. In hide and skin marketing chain whole sellers buy hide and skin from urban assemblers and village collectors from district and regional markets and sell in bulk for regional markets wholesaler to Addis Ababa market.

**Retailers:** are those actors who perform the last marketing function by linking consumers with other traders and/or producers. The number of these traders varies according to the demand and supply condition. In the time of holydays the number of retailers reaches its peak and drop as the holyday ends.

**Processors:** The number of actors in this category is very limited and most hide and skin are supplied to consumers without passing any processing function that adds farm utility to the product. But in Ghinchi town there are few processors using the traditional processing technology and supply for supermarkets.

**Consumers:** are actors in hide and skin subsector comprises the full range of the society in all parts of the country as well as abroad which utilize the value added products of hide and skin. Consumers are the final end points and are the ultimate goal of the production and marketing process and the consideration of whom is central for which the development of the subsector organization comes to reality.

### Hide and skin marketing channel

Hide and skin products market channels connect producers: urban assemblers, wholesalers: retailers, consumers as shown below. The starting point in the hide and skin market channel is the producers. The final users of the products are the consumer with in the country or all over the world through export.

**Channel 1-**Producers → Local Tanners → Consumers

**Channel 2-**Producers → Rural collectors → Local Tanners → Consumers

**Channel 3-**Producers → Rural collectors → Urban Collectors → Wholesaler  
→ Modern Tanners → Consumers

**Channel 4-**Producers → Wholesaler → Modern Tanner → Consumers

**Channel 5-** Producers → Modern Tanner → Consumers



## Econometric Analysis

### Determinants of hide and skin market supply

Multiple linear regression models were employed to identify the factors. Analysis of factors affecting farm level marketable supply of Hide and skin were found to be important to identify factors constraining hide and skin supply to market. Fourteen explanatory variables were hypothesized to determine the household level marketable supply of vegetables. Access to market information, hide and skin marketing experience, sex of the household head, age of the household head and amount of type of breed utilized affects positively and significantly.

Hide and skin are produced for market and consumption purpose and are important cash generating activity in Dendi district. This is due to the potential livestock production in the area. All sample households are good supplier of hide and skin to the market. The number of hide and skin collectors and retailers were 16 and 24 respectively.

**Table 1. Determinants of Hide and skin quantity supplied to the market**

Variables	Hide			Skin		
	Coeff.	Std. Err.	t-value	Coeff.	Std. Err.	t-value
QPron	0.370	0.108	1.25	0.873	0.015	101.64
HSExp	0.469	0.219	0.074*	0.025	0.023	0.069*
Land	0.206	0.125	1.32	0.024	0.052	0.32
Educ	-0.154	0.778	-0.21	0.257	0.474	0.76
TLU	0.147	0.442	0.42	-0.052	0.115	-0.38
AExte	-8.08	3.912	-2.03	0.366	0.533	0.69
Family	0.115	0.154	0.65	0.100	0.081	1.24
Credit	3.109	1.969	1.58	-0.010	0.456	-0.02
Age	0.140	2.039	0.053*	0.822	0.349	0.059*
MktInf	3.075	1.570	0.033**	-0.354	0.510	0.028**
DfMkt	-1.234	1.255	-0.98	-.243	0.363	-2.67
Sex	1.525	1.682	0.061*	-0.380	0.348	0.72*
Brdtyp	3.109	1.969	0.02**	-0.010	0.456	0.044**
R2	86.04	93.71	84.81	R2	86.04	93.71
F/Chi2	292.192***	92.44***	75.96***	F/Chi2	292.192***	92.44***
N	47	50	37	N	47	50

Note: Dependent variables are amount of hide, sheep skin and Goat skin sold in kg. \*\*\*, \*\* and \* are statistically significant at 1%, 5% and 10%, respectively. Std.Err is robust. Access to extension in the Woreda was excluded from hide and skin supply model result due to multicollinearity.

Source: Own computation from survey result, 2016



Table 2 below presents the coefficients from multinomial logit regression on the existing alternative marketing outlets in the sample and the marginal effects. The sign of the coefficient shows the direction of influence of the variable on the logit. It follows that a positive value indicates an increase in the likelihood that a household will change to the alternative option from the baseline group. The result showed that some of the variables were significant at both market outlets while some others were significant in one marketing outlet but not in the other outlet. Compared to the base category (wholesalers) access to education, age of household head, family size and membership to any cooperative determined the selection of collector as market options while the variables feed supplementation, availability of lagged price of hide and skin, credit for hide and skin and sex of household head affected the choice of retail outlet.

The positive estimated coefficients of a variable indicates that the probability of the producers being in either supplying to collector market outlet or retailer market outlet relative to supplying to wholesaler market outlet increases as these explanatory variables increase. The implication is that the probability of the producers to be on these outcomes is greater than the probability of being wholesaler outlet (the base category). The negative and significant parameter indicates the probability of using wholesale outlet is higher than the probability of being in the two alternatives. Estimates not significantly different from zero indicate that the explanatory variable concerned does not affect the probability of the producers decision to use wholesaler outlet category than in the other two categories.

Table 2. Coefficients and marginal effects of Multinomial Logit Model for the choice of marketing outlets

Variables	Collectors			Retailers			Collectors			Retailers		
	Coeff.	Std. Err	Z- test	Coeff.	Std. Err	Z- test	Dy/ dx	Std. Err	Z- test	Dy/ dx	Std. Err	Z- test
VAA	1.375	.437	-1.77	.051	.558	0.09	-.316	.096	-3.16	.058	.075	0.03
EDUC	.453	.360	1.12	-1.162	.668	-1.7	.144	.101	1.43	-.139	.083	-1.21
EXTE	-1.585	.746	-2.12	-3.580	1.51	2.50	.043	.166	0.26	-.558	.253	-2.11
AVLGP	-.583	.663	-1.03	-.337	.885	0.38	-.124	.117	-1.06	-.013	.085	0.93
FAMSIZ	.838	.503	1.50	-.844	.638	-1.3	.185	.098	1.89	-.117	.090	-1.06
CRHS	-.190	.772	-0.24	-.777	.714	-.09	-.017	.160	-0.11	-.062	.059	-0.32
OTRAN	1-.834	.478	-1.75	1.023*	.607	1.68	-.140	.099	-1.41	.072	.069	1.17
FSUPP	-.131	.132	-0.99	-.183	.140	-1.3	-.021	.027	-0.80	-.014	.012	-1.47
MCOOP	-1.502	.650	-2.16	-.492	.692	-0.7	-.234	.095	-2.47	-.011	.065	-0.85
DISFM	.547	.435	1.26	-.711	.553	-1.2	.144	.087	1.66	-.093	.066	-1.22
SXHHH	-.134	.867	-0.15	1.489	1.35	1.10	-.065	.196	-0.33	.098	.062	1.62
AGHHH	.031	.032	0.97	.047	.037	1.27	.005	.006	0.80	.004	.003	1.34



Wholesale outlet is base outcome.  $dy/dx$  is marginal effect.  $N=117$ ,  $LR \chi^2(70) = 292.192^{***}$ , Pseudo  $R^2=0.273$ .  $157 \log$  likelihood =  $-292.297$ .  $***$ ,  $**$  and  $*$  are statistically significant at 1%, 5% and 10%, respectively.

Source: Own computation from survey result, 2016.

**Sex of the household head (SXHHH):** Sex of the household head has a significant and negative effect on the farmers' participation decision. This implies that being female headed household would decrease participation by 0.098 which is significant at 10% probability level.

**Family size (FAMSIZ):** it has significant and positive effect on the farmers' participation decision to sell their produce or not. This implies that as the number of family members increased by one the probability of that family to become seller hide and skin would increase by 0.5 on average which is significant at 5% probability level.

**Feed supplementation (FSUPP):** Most literatures agreed that supplementation of feed for Livestock in production system significantly increase their productivity. The above result also revealed that feed supplementation highly affects the farmers' decision of hide and skin supply by 0.085 at 10% level of significance.

**Average lagged price of hide and skin (AVLGP):** The average lagged price of hide and skin influence the value obtained from the sale of hide and skin positively or negatively. An increase in the average lagged price of local hide and skin by one birr the value obtained from the supply of hide and skin the market either increase or decrease by 20 birr.

**Credit taken for hide and skin production (CRHS):** Credit use by the sample respondents negatively affects the supply of live hide and skin to the market by 0.026. The value obtained from the sale of hide and skin for sample respondents who get access to credit has shown a decrease by 0.026 than those who do not access credit and at 10% level of significance.

## POLICY IMPLICATION

Based on the empirical results and discussions, the following points need to be considered as a possible policy implication in order to increase the value addition

- ❖ A clear policy and strategy for the development of leather sector should be developed by government



- ❖ Strong extension service that caters for both proper animal husbandry and raw material management should be in place
- ❖ Use of technologies that converts the poor quality materials to good quality leather products can help value addition to grow.
- ❖ the trader as well as producer should use technology properly.
- ❖ Institutionalizing the management of the leather sector will provide a sustainable approach to growth of the sector.
- ❖ Promote industrialization and value addition in the sub-sector as it has the potential for increasing income livelihood diversification and employment generation
- ❖ The country's extension system was cereal based hence the government must design a strong extension service policy to strengthen hide and skin producers.

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